

Caesar Rodney Institute Intervener Comments on PSC Docket 11-399 SREC Pilot Procurement Program (Revised 10/27/11)

The solar industry is at a tipping point that will not only lead to rapid adoption of the technology in Delaware but will also remove a \$160 million potential ratepayer risk. The proposed program stands in the way of that outcome. While this is a one-year pilot program once in place it is likely to continue so it is appropriate to look at the long term consequences. It took a decade for solar power capacity in Delaware to reach 6 megawatts (MW). Application documents indicate 74 MW of new capacity may be installed in the 2011 compliance year (June 1, 2011 to May 31, 2012). Consider the following:

- Solar module prices have dropped 50% in the last year and could drop further as price support subsidies are removed globally and global sales equal 25% of global production capacity. The lower module costs have not had time to be reflected in installation prices in Delaware. Lower prices will lead to higher sales in all Tiers.
- A primary obstacle to solar power sales has been the high initial out-of-pocket cost which is removed with new leasing options so sales of Tier 1 projects will increase.
- Current and new 2011 capacity alone will supply enough Solar Renewable Energy Credits (SREC) to meet Delaware's Renewable Portfolio Standard (RPS) requirements, with banking, until 2023 (see Appendix Table 2). All Tiers will be oversubscribed.
- Auction prices for SREC's have dropped from about \$300 to \$100 and the overwhelming new supply will likely reduce the price further so there is no danger of Delmarva Power being required to pay any \$400 Alternative Compliance Payments.
- The Pilot Procurement SREC price, including the fee charged by the Sustainable Energy Utility (SEU) and the 10% bonus for using Delaware installers, could result in an equivalent SREC cost of \$290, a \$190 premium over the current auction price. Maintaining that \$190 SREC premium could cost Delmarva Power customers \$160 million between now and 2025 (1.635 million SREC's X 52% share of Tier 1 to 3 X \$190).
- The estimate of more jobs being created with a higher percentage of small installations ignored jobs lost due to higher electric prices. Including this factor shows each added Tier 1 installation job costs 1.8 jobs elsewhere.

The timing of the proposed SREC Pilot Procurement Program is so inappropriate we respectfully recommend Delmarva Power withdraw the Application! The 2010 REPSA Amendment provided five measures to judge the program:

Least administrative impact on electric suppliers

The Pilot Procurement program accomplishes this but so does simply buying SREC's on the spot market.

Minimize cost of complying with REPSA

The evidence is overwhelming ratepayers will see lower costs by Delmarva Power buying SREC's at auction. The number of forecasted SREC's likely to be available in 2011 is 16 times what is needed to meet RPS requirements (Table 1) so there is no chance Delmarva will pay the Alternative Compliance Payment any time soon. There is also no chance auction prices will increase any time soon with the flood of new SREC's that will be available. Auction prices are likely to slip further. As stated above maintaining a \$190 premium for SREC's could cost Delmarva Power ratepayers \$160 million between now and 2025. The Pilot Program does avoid the administrative cost of buying SREC's but so does simply buying them at auction. Concerns about the bid to sale closure ratio are dealt with by many businesses competing in a free market and are not unique to the solar industry. The solar installers will need to put internal systems in place to cope with this problem as other industries have.

Establish revenue certainty for solar system buyers

The primary reason more systems are not sold is the high initial cost. Even with all the subsidies the systems require a minimum five to nine year payback period. A recent study by Daniel Brown and Edward Ratledge at the University of Delaware ("Energy, the Environment and Delaware Jobs: Household and Energy Efficiency") shows most potential customers want a two to three year payback. The study also showed consumers are most often concerned with the initial cost and uncertainties of realizing a return. Boosting the SREC price with the Pilot Procurement Program does not address the initial cost which can be as high as \$35,000 to \$50,000.

The fastest way to expand sales volume is to lower initial system cost. Lower subsidies and competitive bidding would lead to lower initial cost. Lower costs would also reduce the cost of systems to taxpayers paying for grants and tax credits and to ratepayers paying for SREC's. Lower subsidies leave more money for other purchases to spur the overall economy. Objections to higher initial cost can also be addressed with new leasing options becoming available using a \$280 million grant from Google (http://articles.baltimoresun.com/2011-07-03/business/bs-bz-hancock-solar-leasing-20110703_1_solar-electricity-sungevity-solar-leasing)

Maximize in-state generation and manufacturing

A study by Vote Solar Initiative, an industry advocacy group, shows supplying the state's entire SREC requirement through 2019 with Tier 1 (projects under 50KW in size) versus the expected mix of project sizes would add nine jobs/MW of new solar capacity (187 net job difference/21MW year average added capacity).

The Vote Solar study did not consider the negative impact of higher electric rates. A one megawatt installation would add nine jobs in the year of installation. Meanwhile, the added cost of Delmarva Power buying higher than spot market priced SREC's (1250/MW according to

Vote Solar) could be as high as \$237,500 a year for ten years or \$2.38 million (1250 SREC's @ \$190 premium X 10 years). We know each \$147,000 of electric premium eliminates one job elsewhere (The Cost and Economic Impact of Delaware Renewable Portfolio Standard) so the negative impact would be 16 jobs lost. Therefore each additional job created by small size projects would eliminate 1.8 jobs elsewhere in line with other studies from around the world (see appendix 1)

Table 1: 2011 SREC Production from New Solar Sources

Tier	2011 Delmarva SREC Allowance ¹	2011 New SREC's ²	2011 non-DSEC SREC's ²	Tier 4 SREC's ³	PJM 2010 Compliance Year SREC's ⁴	Total	%
1	2195 ⁵	3029	1515		8247 ⁷	12791	9.6
2A	1473 ⁵	3409	1705			5114	3.8
2B	1000	9004				9004	6.8
3	2250	16668				16668	12.5
4	1615		15150 ⁶	74250 ⁷		89400	67.2
Total	8533	32111	18370	74250	8247	132978	

1 Delmarva Power First Response to PSC Staff questions page 9

2 Delmarva Power Further Support for Application DSEC Sales Projection Report

3 Delmarva Power Further Support for Application Tier 3 & 4 Projects List, page 3

4 PJM Interconnection GATS Compliance Year Annual Report

5 Splits Delmarva Contract SREC Purchases 60% Tier 1, 40% Tier 2A

6 Total first year SREC's from the Dover Sun Park

7 Multiplies 50 MW new Tier 4 capacity by 1485 SREC/MW

Selling SREC's to other states is an unlikely outlet. Many states have closed their borders to SREC trading. According to the PSC Delaware solar generators can sell SREC's in Delaware, Pennsylvania, and the District of Columbia. For the 2011 compliance year PA will need 29,180 SREC's and will produce up to 133,000. DC needs 4,860 SREC and will produce about 20,000. Table 1 shows Tier 1 and 2A will be oversubscribed by five times and Tier 2B and 3 by eight times.

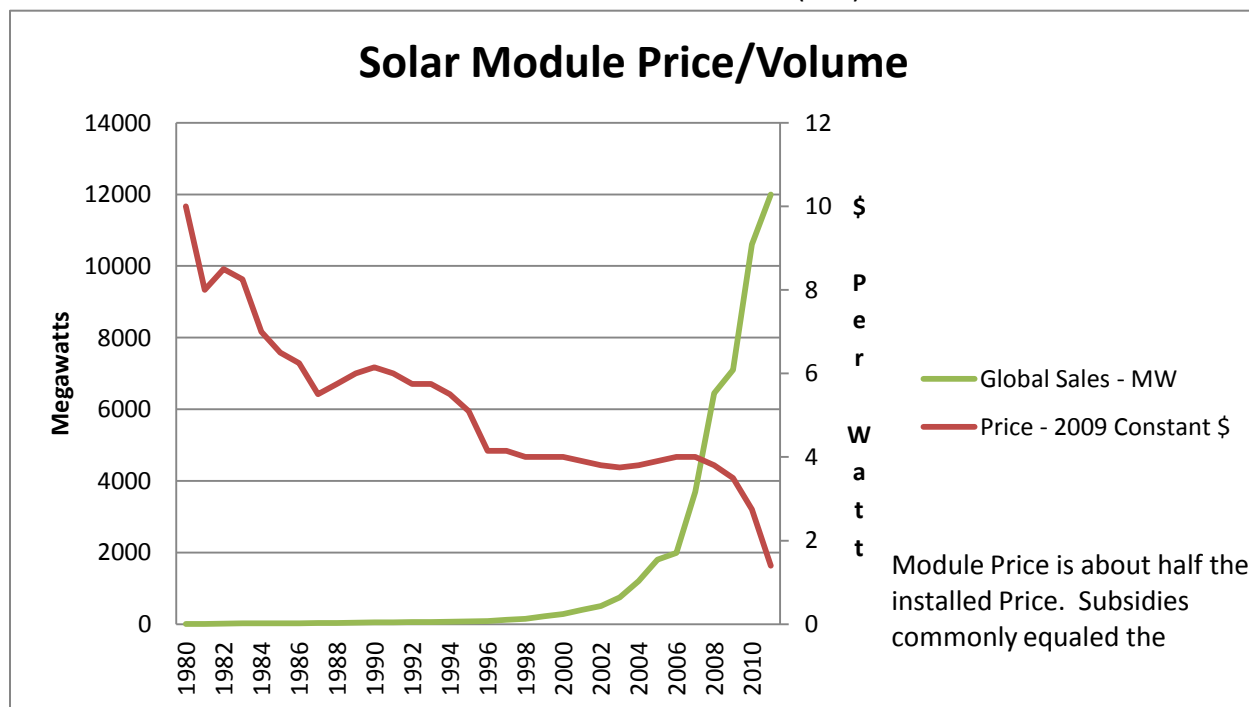
Note: Energy demand by state is available at the U.S. Energy Information Agency, RPS requirements are from www.dsireusa.org, and available SREC's comes from PJM Interconnection GATS Annual Reports.

Ensure all sizes of solar systems are financially viable

The Pilot Program supports higher installed costs which discourage use. Installers have no incentive to lower prices when subsidies are high as seen by the 8% decline in installed prices compared to a 50% decline in module prices in the last year (Delmarva Power Further Support for Application Appendix page 6). The same document shows utility scale project prices dropped 22% over the same period. Subsidy support for high solar panel prices is also seen in the years 1997 to 2008 in Chart 1.

A primary obstacle to solar power sales has been the high initial out of pocket cost often not recovered for five or more years. This is removed with new leasing options becoming available using a \$280 million grant from Google (http://articles.baltimoresun.com/2011-07-03/business/bs-bz-hancock-solar-leasing-20110703_1_solar-electricity-sungevity-solar-leasing). The combination of lower solar power prices and leasing will ensure Tier 1 and 2A segments thrive without the Pilot Program. According to Dale Davis, President of CMI Solar Electric and President of the Delaware Solar Energy Coalition, "This is realistically the next step. As prices continue to drop, we don't need such a big rebate", ("Sun could be sinking on state rebates" Aaron Nathans, News Journal, March 6, 2011).

Chart 1: U.S. Solar Module Prices and Volumes 1980 to 2011 (Est.)



Sources: U.S. DOE 2008 Solar Technologies Market Report, 2007 PV Insider's Report, PVinsights.com Weekly Module Prices, "Roof Top Solar Prices Fall Precipitously" news.cnet.com

Before 1997 subsidies were much smaller and changed frequently. From 1980 to 1996 module price dropped almost 60%, or about 6% a year, on a 25 fold increase in volume.

Starting in 1997 massive subsidies in western countries, particularly in Europe and California, essentially totaled more than the cost of the installed system. System buyers also wound up with essentially zero electric bills. Module prices barely moved from 1997 until 2008 while volume increased 53 fold. Projecting the 6% a year decrease forward from 1997 to 2011 the current \$1.40/module price is about where they would be without those large subsidies. The downturn in prices starting in 2008 was caused partly by subsidy fatigue in western countries leading to lower subsidies. We calculate the current residential installed price should be \$4.65/watt and the author received a quote at that price in February, 2011 (See Exhibit 1).

Appendix

Table 2: SREC Requirements vs. SREC's Available by the End of 2011 CY

Year	Delmarva SREC Requirement X-Bloom	Available ¹ SREC's	Balance
2011	8533	93085	84552
2012	16238	92620	160934
2013	29108	92156	223982
2014	44549	91696	271129
2015	64987	91237	297379
2016	81836	90781	306324
2017	92334	90327	304317
2018	108520	89875	285673
2019	124940	89426	250159
2020	141598	88979	197540
2021	158495	88534	127579
2022	163090	88091	52580

note 1: 70% of available SREC's to Delmarva Power with 30% to Delaware Electric Coop and Municipal Utilities, reduced by 1/2%/yr to allow for lower efficiency with system age

List of studies showing net job losses caused by “green” energy premiums

Country Jobs Lost for each Green Job Created

Spain **2.2**

Study of the Effects on Employment of Public Aid to Renewable Energy Sources Gabriel Calzada Álvarez PhD., Universidad Rey Juan Carlos, <http://www.juandemariana.org/pdf/090327-employment-public-aid-renewable.pdf>

Delaware **2 to 8**

The Impact of the Delmarva/Bluewater Wind Power Purchase Agreement on the Delaware Economy, Edward C. Ratledge, Director, Center for Applied Demography & Survey Research at the University of Delaware

UK **3.7**

“Worth the Candle: The Economic Impact of Renewable Energy Policy in Scotland and the UK”, Verso Economics, Richard Marsh & Tom Miers

Italy **4.8 to 6.7**

“The Myth of Green Jobs: The European Experience”, American Enterprise Institute, Kenneth P. Green

Exhibit 1: Results of Residential Solar Quotation Request February, 2011

Proposal Company	Eclipse Solar	CMI	Clean Energy USA	KW Solar	CNC
Price	36,190	39,307	41,360	36,389	25,668
Cost/Watt \$	5.50	5.78	5.50	5.99	4.65
System Size	6,580	6800	7524	6080	5520
First Year watts produced	8,192	8140	9976	8014	7121
Subsidized Cost/Watt Produced	2.18	2.74	2.33	2.56	1.89
output/rating %	124%	120%	133%	132%	129%
State Subsidy	7,435	7,500	8,140	7,056	6,417
Federal Tax Credit	10,857	9,542	9,966	8,800	5,775
SREC Assumed Price \$	260	290/10, 50/	300	330	250/10,45/
SREC life Years	15	20	15	25	
SREC Value		33,215	41,464	55,192	
Federal Tax Rate %		25	33		
Starting Electric Rate \$	0.12	0.14	0.158	0.155	0.140
Electric Rate Increase %		3.5	4.5	5	2.5
% Power Replaced, 1st year	101	100	123	99	16
Inverter Life Years		10	15	10	15
Inverter Replacement Cost \$	5,000	5000	5,000	1,701	
Payback Years	5.7		5 to 6		4.8
IRR % Calculated by Supplier			17.6	12.73	20.8
Levelized Cost of Electricity			0.114		
Panel Manufacturer	Motech	Motech	SunPower	Motech	Mage Solar
Maintenance Cost/yr		400		0	0
Aggregation Encouraged	NO		YES	NO	
Panel Efficiency Reduction Rate %			1	0.75	0.75
System Life Years	25	25	25	25	25

Exhibit 2: Dover City Utility Contract with Dover Sun Park Electric & SREC Prices

<u>Year</u>	<u>MWh</u>	<u>\$MWH</u>	<u>Energy \$</u>	<u>SREC \$</u>	<u>SREC \$ Paid</u>
2012	15150	73.23	1,109,435	137.02	311,378
2013	15074	76.63	1,155,140	140.08	316,740
2014	14999	80.38	1,205,610	142.98	321,681
2015	14924	91.79	1,369,863	138.42	309,865
2016	14849	104.59	1,553,085	132.67	295,508
2017	14775	111.45	1,646,676	133.09	294,961
2018	14701	114.32	1,680,635	137.70	303,652
2019	14628	112.47	1,645,170	147.26	323,110
2020	14554	117.28	1,706,952	150.40	328,350
2021	14482	129.64	1,877,411	146.21	317,606
2022	14409	138.63	1,997,564	145.64	314,786
2023	14337	141.50	2,028,724	151.46	325,728
2024	14266	156.87	2,237,842	145.02	310,319
2025	14194	164.24	2,331,265	146.86	312,685
2026	14123	160.84	2,271,589	159.75	338,429
2027	14053	166.12	2,334,430	164.24	346,202
2028	13982	171.27	2,394,767	169.14	354,748
2029	13912	177.80	2,473,642	172.98	360,987
2030	13843	184.82	2,558,451	176.63	366,762
2031	13774	192.13	2,646,344	180.32	372,552
Total	289030	2666	38,224,593	3,017.87	6,526,048
Average		133.3		150.89	